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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,271	09/30/2003	Akiko Toriyama	SON-2863/CIP	2075

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EXAMINER

NGUYEN, THANH NHAN P

ART UNIT PAPER NUMBER

2871

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,271

Applicant(s)

TORIYAMA ET AL.

Examiner

(Nancy) Thanh-Nhan P. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 2, 4, 6 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/6/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to Election/Restriction dated 3/23/2005.
2. Applicant provisionally elects, without traverse, the invention of the species "a" (claims 1, 3, 5, and 7). Accordingly, claims 1, 3, 5, and 7 are pending for the examination; claims 2, 4, 6, and 8 are cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al U.S. Patent No. 6,853,435 in view of McKnight et al U.S. Patent Application Publication No. 2003/0058385.

Referring to claims 1 and 3, Tanaka et al discloses a liquid crystal display element configured by holding a liquid crystal layer (204) between a pair of substrates (201, 208) arranged to face to each other, [see fig. 14], wherein a twisted nematic type liquid crystal material, [see col. 21, lines 49-55], wherein a twisted nematic type liquid crystal material used in said liquid crystal layer has the dielectric constant anisotropy $\Delta\epsilon = 7.8$, [see col. 9, lines 2-3], and twist elasticity modulus $K_{22} = 7.5$ pN, [see col. 9, line 4].

Tanaka et al lacks disclosure of the refractive index anisotropy Δn is $0.16 \leq \Delta n \leq 0.18$, and the range of a cell gap d indicating a distance between the substrates of liquid crystal element is $2.0 \mu\text{m} \leq d \leq 3.0 \mu\text{m}$.

McKnight et al discloses the refractive index anisotropy Δn typically varies between 0.08 and 0.25, [see par. 0037]; and the cell gap d typically ranges less than $1 \mu\text{m}$ to over $7 \mu\text{m}$, [see par. 0034], for the benefit of optimizing the brightness and color saturation of the display, [see par. 0032]. The range of refractive index anisotropy Δn is 0.16 and 0.18, and the range of a cell gap d is $2.0 \mu\text{m}$ and $3.0 \mu\text{m}$ are in the range(s) that disclosed by McKnight, and would have been obvious to one of ordinary skill in the art. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the range of refractive index anisotropy Δn is 0.16 and 0.18, and the range of a cell gap d is $2.0 \mu\text{m}$ and $3.0 \mu\text{m}$, for the benefit of optimizing the brightness and color saturation of the display.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al in view of McKnight et al as discussed above, and further in view of Nishimura U.S. Patent Application, Publication No. 2002/0054266.

Referring to claim 5, Tanaka et al lacks disclosure of a range of a pixel size of a pixel of liquid crystal display element is $18 \mu\text{m}$ or less.

Nishimura discloses the pixel size is approximately $12 \mu\text{m}$, [see par. 0004], for the benefit of making "microdisplay" for being used for viewfinders in digital cameras and camcorders, in projection monitors; or fixed to a frame, such as eyeglasses,

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thereby giving a user a virtual image of a virtual computer screen which is very light weight and also very private, [see pars. 0007, 0008]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have a pixel size of a pixel of liquid crystal display element is 18 μm or less for the benefit of making "microdisplay".

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al U.S. Patent No. 6,356,332 in view of Tanaka et al, and further in view of McKnight et al.

Referring to claim 7, Ichikawa et al discloses a projection type display device comprising a light source (371); a light convergence optical system (372) for guiding a light emitted from light source to a liquid crystal display element; a projection optical system (380) for enlarging and projecting a light subjected to light modulation by liquid crystal display element, [see fig. 16], wherein liquid crystal display element is configured by holding a liquid crystal layer between a pair of substrates arranged to face to each other, [see fig. 4].

Ichikawa et al lacks disclosure of the liquid crystal layer used is a twisted nematic type liquid crystal material that satisfies dielectric constant anisotropy $\Delta\epsilon$ of $0 < \Delta\epsilon < 8$ and twist elasticity modulus K_{22} of $K_{22} > 6.0 \text{ pN}$.

Tanaka et al discloses a twisted nematic type liquid crystal material, [see col. 21, lines 49-55], wherein a twisted nematic type liquid crystal material used in said liquid crystal layer has the dielectric constant anisotropy $\Delta\epsilon = 7.8$, [see col. 9, lines 2-3], and

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twist elasticity modulus $K_{22} = 7.5$ pN, [see col. 9, line 4], for the benefit of improving the bend transition characteristic, [see col. 21, lines 24-25], and exhibiting quick response and a wide field of view, [see col. 1, lines 6-8]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have of the liquid crystal layer used is a twisted nematic type liquid crystal material that satisfies dielectric constant anisotropy $\Delta\epsilon$ of $0 < \Delta\epsilon < 8$ and twist elasticity modulus K_{22} of $K_{22} > 6.0$ pN for the benefit of improving the bend transition characteristic, and exhibiting quick response and a wide field of view.

Ichikawa et al also lacks disclosure of the refractive index anisotropy Δn is $0.16 \leq \Delta n \leq 0.18$.

McKnight et al discloses the refractive index anisotropy Δn typically varies between 0.08 and 0.25, [see par. 0037], for the benefit of optimizing the brightness and color saturation of the display, [see par. 0032]. The range of refractive index anisotropy Δn is 0.16 and 0.18 is in the range that disclosed by McKnight, and would have been obvious to one of ordinary skill in the art. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the range of refractive index anisotropy Δn is 0.16 and 0.18 for the benefit of optimizing the brightness and color saturation of the display.

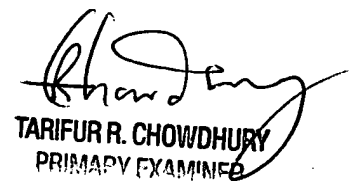
Any inquiry concerning this communication or earlier communications from the examiner should be directed to (Nancy) Thanh-Nhan P. Nguyen whose telephone number is 571-272-1673. The examiner can normally be reached on M-F/9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 15, 2005

TN


TARIFUR R. CHOWDHURY
PRIMARY EXAMINER